

## Accelerator Systems Division Highlights Ending February 4, 2005

### ASD/JLAB: Cold Linac

### ASD/BNL: Ring.

Brian Boos and Richard Marvin (IG Audit) were guests at BNL this week. While here, they spoke with BNL/SNS Project Office personnel (J. Wei, K. Mirabella, R. van Wormer and W. McGahern), Tech Rep for BNL/SNS QA (R. Savage), BNL Procurements Manager (D. Dale) and DOE Federal Project Director (M. Butler). In addition to the one-on-one interviews, R. Marvin was taken on a two hour tour of the magnet assembly area in buildings 902 and 905. In their close-out statements, the auditors indicated that even though analysis is still to be done and a decision made on whether to launch into next phase of an audit, they are not likely to return to BNL. They stated that during their review at BNL, they focused on two concerns: (1) Diagnostics - where the correction plan initiated about a year ago is now on track and "concerns have been expelled" and, (2) magnet deficiencies related to vendor deliveries - here, the team at BNL was convincing that the tracked deficiencies will not impact component quality or machine performance and there is "no reason for us to second guess the experts". Thus, at the conclusion of the close-out meeting, the auditors stated that "there are no BNL/SNS issues to report on".

17D224 Core: Pioneer Steel reported that the magnet core is fully assembled, painted and crated for delivery to BNL. The magnet core is scheduled to arrive at BNL on Monday morning, Feb. 7<sup>th</sup>.

17ELS224 Magnet: Alpha Magnetics reported that they will ship the completed magnet to BNL this week. Included with this shipment will be the extracted beam pipe plus the upstream and downstream flanges).

Equipment shipped from BNL this week (2/1/05) included:

- chicane dipole #2 and stand
- chicane dipole #3 and stand
- chicane dipole #4 and stand

Next week there will be two truck deliveries from BNL.

Truck #1 (delayed from 1/27 to 2/8/05):

- Injection kicker magnet (short; last one)
- RF power supply (drained water, PT, and winterized this week. A-OK)
- Wall Current Monitor (WCM) for RF straight section
- RTBT vacuum chambers
- SNS BLM – 1 crate of 23 ion chambers (#4 of 4)
- SNS Electron Detectors – 1 crate of 7 electron detectors and hardware
- LANL Motion Equipment – 1 box of motor drive equipment (controller/interface/cables etc.)
- SNS 2U BCM – 1 box of chassis retrofit parts
- SNS 2U BCM – 8 boxes of 2U chassis
- SNS BLM – 3 crates of 206 Ion Chambers
- SNS 4U BCM – 6 boxes of 4U chassis on 2 wrapped pallets

Truck #2 (2/9/05): we will ship quad doublet #2 for the collimator straight section.

Our TiN coating schedule has been changed to provide a higher priority to the BIG vacuum chamber. The new coating priorities are IPM, BIG, followed by the chicane chambers. Coating of the two IPM chambers will begin on Monday, Feb. 7<sup>th</sup>.

Final assembly continues on:

- The K2 extraction kicker magnets (bake-out using new blankets and controls is underway). The assembly will be ready for shipment in early February.
- The K1 extraction kicker assembly.
- The modified vacuum chamber for the #2 injection dump septum magnet.

- Quad doublet assemblies for the collimation and extraction straight sections.

36Q85 quads: three quads have been measured. Set-up of #4 is underway.



### Controls

Design for the Central Control Room (CCR) consoles has been finalized and frozen. The PPS consoles are being assembled – north sector ICS consoles will follow. Three temporary consoles are operational in the south arc. PPS racks are close to finished at DCS, as is the TPS enclosure.

The phase 1.2 PPS has been decommissioned and the control panel rack has been successfully moved from the Front End to the CLO control room. Communications have been established over the fiber backbone. New PLC programs for PPS phase 1.3 have been downloaded and integration testing has begun in preparation for recertification on February 26.

All test software for SCL power supplies operated from IOC 1-9 is ready. Power Supplies QD03, QD04, QD05, QD06, QD07, QD08, QD09, QH10, QV10 and six HEBT supplies have already been tested.

A draft P&ID for a pumping system to remove water from the RTBT Harp vessel after a proton window breaks has been generated. A Cable pull list has been started.

A new MPS auto test program has been developed. One associated screen shot is shown below. This program might also be useful to operations when changing machine modes. It shows the present input status of an MPS input and will show up in red in other beam modes if it will trip in that beam mode

All laboratory MPS IOCs have been upgraded to EPICS R3.14.7 and the VxWorks SNS07-RC7 Kernel. Software upgrades for all front-end and mps production IOCs have been prepared. The same upgrades are being prepared for the Hot Spare.

An autodialer to notify the ion source hot spare personnel of problems is ready to be installed. The LEBT chopper is also being moved to the hot spare stand for further testing. The HPRF IOC was shipped to from BNL to ORNL. Previously, 4 LLRF IOCs had been shipped. This completes all RF hardware shipments from BNL to ORNL.

The RTBT vacuum IOC was also shipped. The Ring vacuum IOC is still at BNL, serving as a development platform. It will be shipped when the development lab is dismantled (within 2 months).

Besides the Ring vacuum IOC, only 2 other operational IOCs remain at BNL. They are the IOCs associated with halo scraping and dump monitoring in the HEBT and Ring. As reported previously, those IOCs have been configured and installed in racks undergoing tests of the motion systems at BNL. Those racks are both scheduled to be shipped before the end of the month.

At the right is a photograph of the completed Ring rack taken prior to its transfer to the motion testing lab.

Xiaosong Geng of the BNL team is currently at ORNL on a prolonged visit to accomplish several goals:

- Help install and commission the HEBT vacuum system for the upcoming SCL run.
- Help install, commission, demonstrate, and hand-off Ring HPRF controls.
- Help install, commission, demonstrate, and hand-off dump monitoring systems, and possibly motion systems.
- Assist in general vacuum installation and commissioning for the SCL run and beyond.

The CHL control room was upgraded to meet operations needs for control of the cryomodules. A new workstation with 2 monitors was added to the control console. Additional monitors were added to 2 other operator workstations. This was done at very low cost since all equipment came from the Front End Control Room. Development and office network workstations were relocated from the control console to a computer table obtained from salvage.

Checkout of the controls for high beta cryomodule 3 was completed and it is now ready for cool-down.

Testing of EPICS 3.14.7 continued with the next 2 Cryomodule IOCs for High Beta 4 – 10. All functions appear to operate correctly. The IOC for High Beta cryomodules 4 – 6 will be installed in the Klystron building next week. The IOC for High Beta cryomodules 7 – 10 will remain in the development system on the CHL mezzanine and used for further testing until field wiring for those cryomodules is complete.

The replacement backplane for the 2 K cold box magnetic bearing cabinet was received. The back plane in magnetic bearing cabinet 2 will be replaced next week.

## Installation

Craft Snapshot 2/1/05

ASD productive craft workers	<b>69.0</b>
Foremen (Pd by 15% OH)	6.0
AMSI management (Pd directly)	3.0
TOTAL AMSI WORKERS	78.0
Less WBS 1.9, 1.2 etc	<b>14.0</b>
Less absent	<b>6.0</b>
TOTAL PD BY ASD/ORNL DB WPs	<b>49.0</b>

## Accelerator Physics

Y. Zhang is calculating the beam-induced fields in a superconducting cavity from the superposition of 6 normal modes. The phase of the induced cavity field will be useful for dead-reckoning the cavity phase for SCL tuneup. S. Henderson has studied the possibility of tuning up the SCL using a simple cavity phase scan recording phase-of-flight from two downstream BPMs. The method can deliver better than 1 degree phase setpoint and 1.5-2% amplitude setpoints for the whole Linac. More accurate setpoints may be possible with larger flight path. An application will be made to automate this process for the whole SCL.

Global coordinates for the SCL, including modifications to quad positions to accommodate warm section interferences, and including RF cavity positions incorporating the real as-built configuration, have been updated and entered into the database. The final coordinates for ring components are being worked out, and an update of SNS global coordinates will be available in 1-2 weeks.

ORBIT simulations of beam stability with the extraction kicker impedance, and full 1.44MW accumulation, show instability if the impedance is increased by 50% (for the zero chromaticity case). The natural chromaticity case is

being studied now. This is another way of characterizing the instability thresholds, basing it on impedance thresholds, as opposed to intensity thresholds.

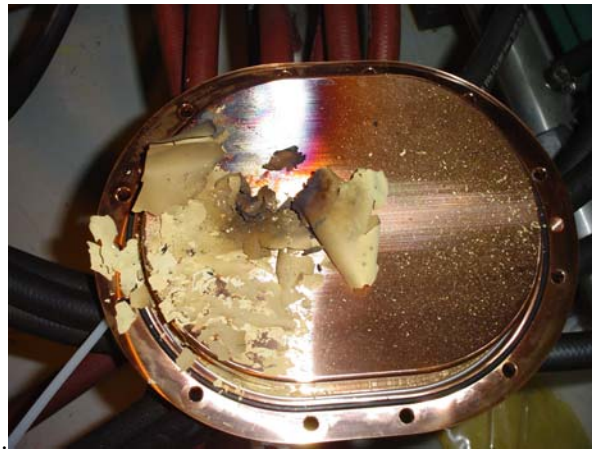
A meeting was held 31/Jan to discuss the ring primary stripper foil actuator that will arrive soon from BNL. The various groups that will play a role with this device (vacuum, alignment, mechanical, diagnostics, controls, and physics) now have a better understanding of how it will be tested, installed, and used.

A meeting was held 2/Feb to discuss the LEBT and MEBT chopper status, and to map out a path forward. We decided to keep the existing LEBT chopper and work to retrofit it to improve its reliability. It is in the process of being moved to the ISTS where development efforts will continue.

An ASD/XFD interface meeting was held 3/Feb. The draft ring/target interface control document was deemed ready for final signatures. There will be simultaneous XFD and ASD work during the Oct/Nov time frame when the beam line at the end of the RTBT is installed, which will require tight cross-division coordination. Also, progress is picking up on the temporary view screen to be used during target commissioning. Optical component selection is in progress, and we are refining the positioning of the view screen with respect to the target face.

## Operations

Assisted with the investigation of DTL5. The downstream inspection port removed and paper found inside. Paper was pyrolyzed (see the e-log entry from 3-Feb). We plan to remove Ion Pump 3 and the last Slug tuner to remove the paper bits.



Deactivated the PPS for its move to the CCR.

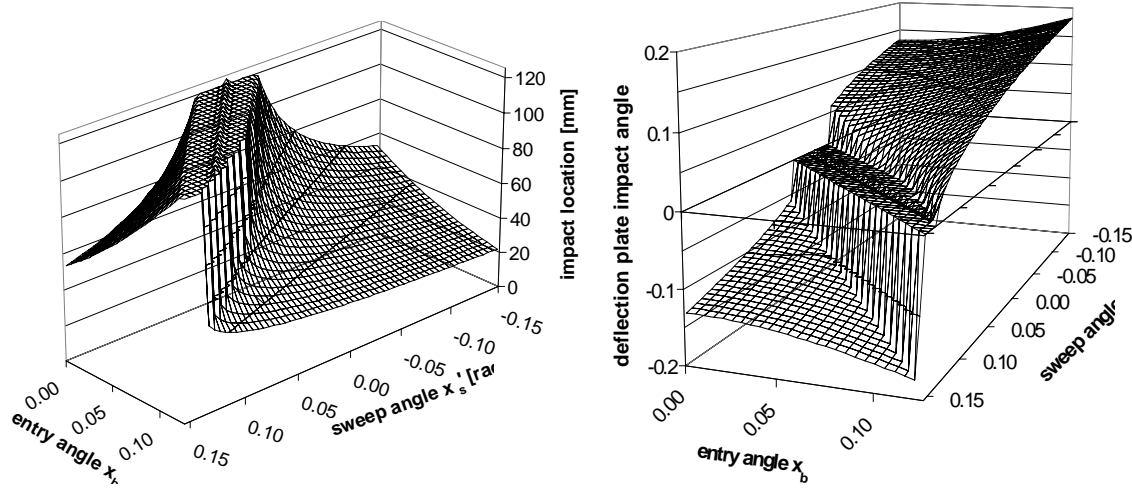
The CCL Beam Dump Shielding is out, as is the first tine of the Labyrinth. The last two tines will be removed next week. Operations is acting in the role of "escort" for the AIMS workers doing the removal.

Two Operations personnel are working with the vacuum group doing SCL Warm Section assembly and installation. In looking at the instability of the RCCS I noticed significant instability in the Chilled Water pressure and temperature. Worked with PSSO on the instability. Discovered that the way that the HVAC in the FELK is being run is creating most of the instability. The Chilled and Hot water systems were fighting each other, resulting in unstable Chilled Water temperature and pressure. Additionally it was an extremely energy wasteful way to operate the HVAC. I reprogrammed the FELK HVAC PID coefficients. The result was reduced amplitude in the Chilled Water pressure variation. I also noted that there was an immediate 50KW reduction in the power used by the chillers. We cannot estimate the savings on the Hot water side because there is no real-time monitor of gas use by the boiler. It appears that the same problem exist in the CLO HVAC, including the possibility of energy savings in HVAC operation. Last Sunday the boiler to the CLO went down, there was significantly reduced Chilled Water use. When the CLO boiler came back on at 11:30 PM on a cold night, the Chilled Water use increased, suggesting that the Hot and Chilled water systems are fighting each other in the CLO HVAC. We could not pursue the CHL HVAC

issue this week due the unavailability of the person programming the PLCs. We will pick this up again next week. All of this, including lots of pictures from the Archiver, is in the Operations e-log, starting last Friday.

### Ion Source

We have completed an analysis of beam dumping in electrical sweep scanners used to measure emittances of low energy ion beams. The left figure shows the distance of impact and the right figure shows the trajectory angle at impact, both as a function of the sweep angle  $x'$  and the beam entry angle. The plateaus represent the second slit. The main concerns are the grazing impact angles encountered when the beam hits a deflection plate. This process was identified as the source of ghost signals found last summer. The analysis also yielded the largest impact angle when scanner is operated within its acceptance:  $\sqrt{8}$  times the deflection gap divided by the deflector length. This confirms the design parameters selected for the stair-cased deflection plates that eliminated the problem.



### Survey and Alignment

In the SCL area we have final aligned one warm section, HB 04. Warm Section HB14 should be completed by noon today (Friday). Next on our list for alignment is Warm Section HB15. T

Fiducialization was completed on three additional 8Q35 magnets. In Magnet Measurement we have aligned two warm section rafts so the vacuum pipes could be installed.

S & A completed final alignment on Cryo Module HB05. There have been three 8Q35's fiducialized

Please see attached PDF files for complete S & A complete SCL alignment status



S\_A\_SCL\_Up  
\_04\_Feb\_2005



S\_A\_SCL\_Sta  
i\_2.pdf (810 K)

The alignment was completed on all magnets and beam pipes on the entire HEBT. Obviously once our global survey network is updated, some components may require slight modifications to their alignment. However, no

alignment changes at a later date should have any bearing on vacuum. As a result we have given the installation teams our blessing to connect vacuum throughout the entire HEBT curve.

S & A has received a significant amount of alignment data on the ring injection area. We are analyzing that data. Further we are providing data to ASD Physics. Our objective is to bring Survey & Alignment and ASD Physics to the same conclusions on this data. So far, analysis is going very well.

S&A performed a final as-built of the shine door and its shear blocks. We had performed an initial as-built a month ago when the shear blocks were temporarily welded into place. This final as-built was requested after the shear blocks were final welded. The data has been sent to the proper personnel for their analysis.

Further analysis was performed on the data from the Ring Injection tunnel deformation study. All of the previously-identified modes of tunnel deformation have continued to operate over the last eight months. In addition, the slowing of the backfill-related settlement has allowed some smaller vertical deformation effects to be discerned, which are probably related to the presence of a repaired construction-induced dropout beneath the Ring Injection area.

It is not known whether these patterns of deformation are currently continuing at the same rate. It is possible that the majority of this deformation occurred shortly after the observation of the network in April 2004. However, if this deformation rate continues unabated, then the tunnels are still not stable enough for components to be installed and remain within their required tolerances per the SNS Parameters List (even for periods of a few months), in any of the three coordinate dimensions. Similarly, the survey control network has been significantly degraded by the tunnel deformation over the last eight months. It is no longer internally consistent enough to align adjacent components within those tolerances.

## **Mechanical**

A dust barrier between the CCL and SCL has been constructed to allow for the block maze removal.

One tine of the DTL/CCL shielding maze has been removed from the tunnel.

The beam box and BCM at the end of CCL4 have been removed and placed in temporary storage.

DTL5 was vented for a visual examination. A piece of paper was found in the cavity so we expect that it will perform well after cleaning.

Background activation levels in the tunnel have dropped even lower with the removal and storage of the activated components.

We have mapped and fiducialized one 21Q40 and today started on the second one.

Warm sections are installed from MB03 through HB04, and HB14, HB15 and HB21. We have 10-8Q35 Quads left to map and fiducialize.

## **Water Systems**

- Installation of the Linac SCL Cryo Warm Section Magnet cooling connections continued.
- Installation of the remote cooling connections for HEBT Collimator #1 was started.
- Installation of the HEBT Collimator closed loop cooling system was started.
- Installation of the Ring SB Power Supply cooling system manifolds continued.
- Installation of the Ring Tunnel Magnet cooling connections continued.

## **Ring Systems Installation**

- The alignment of the HEBT arc Dipole and 21Q40 magnets chambers was completed.

- The HEBT arc Dipole to 21Q40 magnets' vacuum joints were completed.
- The HEBT 12Q45 magnets Qv33 and QH34 were removed and sent to the magnet lab for rotation of chamber.
- The Ring Collimator straight section upstream Doublet Magnet assy was installed.
- The balance of the magnet mounting hardware for the Ring Injection straight section was installed.
- The Injection Chicane magnets #2, 3 and 4 and their support stands were received and staged for installation.
- The installation of the remote cooling connections for HEBT Collimator #1 was started.

### **Electrical Group**

Linac Tunnel – Completed cable terminations for SCL module HB-6 working on cable terminations for SCL module HB-7 and HB-8, warm section terminations

Installing power outlets for pump carts for SCL modules.

SCL ME-5 area – diagnostics, vacuum terminations in progress

SCL ME-6 area – cable pulling and ac power installation, cable terminations in progress

SCL ME-7 area – cable tray and rack installation

SCL ME-8 area – ac power terminations, diagnostics and vacuum cable pulls in progress

Ring – ac power terminations for RF systems, PPS wiring, and rack installation in progress. Completed ac terminations for water system upgrades.

Completed integrated magnet/power supply/controls testing for SCL warm section MB-10, bringing the completed warm section integrated magnet/power supply/controls tests to 8 of 34. SCL warm section MB-11 integrated magnet/power supply/controls testing started this week.

Completed integrated magnet/power supply/controls testing for 1 HEBT power supplies: HEBT\_MAG:PS\_QV01. HEBT\_MAG:PS\_QH02 was tested but the test could not be completed due to overheating of the QH02. The mechanical group is investigating the cause for the magnet overheating. This brings the number of completed HEBT integrated magnet/power supply/controls tests to 7 of 22.

### **HPRF**

SCL-ME-4, all 12 klystrons HV conditioned to 60 KV, radiation survey OK. The 12 tubes powered to 100 KW RF and RF leakage survey performed all O.K.

SCL-ME-5 has oil in tank for 1st 6 tubes, final waveguide connections remain to be done, work on next 5 klystrons proceeding. Hoping to start integration check out of SCL-ME-5 on the 21st.

Coupler transition conditioning proceeding in the RFTF with 30 more transitions needing conditioning. Prototype Thales TH2177 klystrons at 402.5 MHz to be shipped from factory the week of the 14th.

JLab equipment returned to ORNL; expect all here by the end of the month.

HB-2 Cryomodule. Set all four cavities to resonance and characterized tuning drive motor. Measured coupling ratios (S21) between input and pickup ports and HOM ports on cold HB-2 module.

SCL RF ME4: Both transmitters checked out to “Rdy for HV” state. All twelve klystrons brought to 100kW output power into waveguide short. Measured RF leakage and x-rays: both good. Thanks for help from Paul Talerico (LANL).

SCL RF ME5: Installation progressing well (68% complete). Re-oriented two 450 lb circulators and replaced known leaky bellows waveguide.

#### Ring RF

- Submitted a Service Request Order for the Ring RF DC/Control wiring.
- Submitted a Service Request Order for the RF Control Room Rack installation.

#### LLRF

Installation: SCL ME-4 installation and checkout is complete. We are supporting the HPRF checkout of ME-4 as needed. SCL ME-5 installation is in progress and supports the scheduled ME-5 completion date. Some rack-mount components have already been installed in ME-6 and ME-7.

Code Development: Based on the recent experience testing cryomodules, and in collaboration with the SCL area manager, we have made several sequencer and operator screen changes to facilitate more efficient operation when we resume testing in March.

Performance Characterization: We made numerous performance characterization measurements on the normal-conducting and super-conducting sections of the Linac prior to the shut down at the beginning of February. Post-processing of the data is in progress. The goal of this work is to better understand the performance of the low-level RF control systems and to optimize the performance of these systems.

Procurements: We have ordered an additional small run of RF Output daughter boards. We plan to ship the parts kit to the vendor next week. The production should be finished near the end of February.

Reference System: The installation of the reference system components is keeping pace with the SCL installation. Fabrication of the reference line temperature control chassis is nearly complete.

#### Cryo Group

Cryomodule production:

H12: end cans being leak checked

H02: under alignment

Cryomodule testing:

Tested the three cavities in cryomodule high beta 1. Performance at 4.2 K is similar to that of medium beta cavities, with maximum gradients in the 14-15 MV/m range.

Ran 30 cavities simultaneously with closed loop at 10 Hz, 800 microseconds for a whole weekend at gradients around 11 MV/m average.

Continued to verify calibrations and improving accuracy of gradient determination.

Measured Lorentz Force Detuning coefficient for all the cavities that could be controlled in closed loop by the LLRF.

Observed quenches in some cavities driven near the limit.

#### Beam Diagnostics

##### Systems R&D, Physics

- Worked on x-ray measurement of the SCL Cryo module.
- Worked on the BLM test station
- Worked on fixing the Ring pickup and kickers. All damaged connections were successfully repaired and the contact resistance now looks good.
- Writing heat loading program for the CCL-1 Faraday cup.



- Loss monitor inventory for next (June) run:
- For the next run, we are waiting for delivery of 90 ion chambers from BNL and 15 neutron detectors from INR.  
 ICs – have ~90; should have ~150  
 NDs – waiting 25 NDs from INR (really we could install ~15)  
 AFE chassis – Ok  
 Amplifiers – Ok  
 IOCs – Ok
- Details of loss monitor electronics Installation status:
  - Racks, chassis, modules
    - SCL 1 (15 row) no power
    - SCL 2 (35? row) is absent
    - HEBT no MPS, Timing modules; no power
    - Diagnostic cables
 Installation of CPU 5100 into DTL IOC1 and move of ADC from DTL IOC2 to IOC1 continues.
    - DB is Ok
    - SCL IOC1/2 - Ok
    - SCL IOC3/4 have not started
    - HEBT IOC1/2 is Ok
  - Control cables
    - DB is Ok
    - SCL IOC1/2 reboot cable is absent
    - SCL IOC3/4 have not started
    - HEBT IOC1/2 MPS cables are absent
  - Software.
    - SCL IOC1 – Ok
    - SCL IOC2 – Ok
    - SCL IOC3 – should be changed
    - SCL IOC4 – should be changed
    - HEBT IOC1 – should be changed
    - HEBT IOC2 – should be changed
    - Ini files of BLM concentrator should be changes.
      - BLM concentrator should have information about range errors of current (more than 1/10 of HV current) and ADC
      - Maybe we need to have one thread per one IOC?
- Testing.
  - waiting power in racks; detector installation
- Absent items
  - Short LEMO-LEMO cables (in process)

Spare parts, remaining engineering for loss system

- Amplifier modules. We will use 50 and haven't spare. We need 6-10. There are 3 steps.
  - PCBs ordered.
  - Calculate spare components (from BNL, INR and amplifier prototypes) and order
  - Do amplifiers (?) and test them
- ISEG HV VME modules.
  - We will have 45. We will use 43.
- Program finished (first version) for HV chassis. Program tested with HV chassis. To finish, PC and timing card are needed.
- Also needed to do reconfiguration of control systems and change programs Thermal and Si-NDs due timing module and moving to NI DAQ-mx
- Visual .Net C++ installed on office PC. Next step should be installation Epics 3.14.7. But should be done on separate PC at the beginning in order not to drop current settings on office PC.
- BLM for next run. SCL IOC1 and 2 started. Re-observed current BLM status.
- Don't see any problem for next run with current software.

## Diagnostic Installation Work In Progress

### SCL

1. All of the SCL racks except row 30 have the chassis mounting angles, slides, RPC's and RMO's installed. Electrical installation is continuing. Rows 1-75%, 6 -60%, 10-25 %, 15-40%, 30 0% and the rest at 10%. The percentage complete
2. Does not count IOC installation or Timing card installation. IOC's are 34% (19 of 56) installed in SCL and timing card is 0% installed.
3. Our SCL DB crew will be pulling the RF Distribution fiber in to the remaining SCL racks and to the HEBT service building the first of next week. Termination into the fiber splitter boxes will begin when Mary is available, hopefully next week.

### HEBT

1. Electrical inspection has been completed with two exceptions to be cleared;
  - a. The circuit breakers were installed upside down.
  - b. There are a few places where the conductor is exposed from terminals.
2. This work has not started. This work will be scheduled and completed by the electrical group.
3. IOC's are 10% (2 of 21 unless we count the Wire Scanners then it is 41% installed, 13 of 32) installed in HEBT and timing card is 0% installed.
4. Rack 01H09 is in work to install 9th laser scanner, LW32. Slides, angles, and the spare laser systems chassis have been installed.

### Ring

1. Found that one of the power panels mounted on the wall was in front of one of our racks. We plan to move the rack row out 8" from the wall to provide clearance. This work is scheduled for next week.

### General

1. Timing Test Bed and special projects continue to dominate techs work load.
2. Finished the 9 original electron collector amp/bias "T" boxes. Need to build one more to accommodate the addition of laser scanner 32. Parts have been ordered.

### RF Distribution

1. There are 7 chassis complete and ready to install. Plan installation in the SCL next week.
2. Missing parts have been ordered to complete the remaining chassis for SCL and HEBT.
3. The fiber receivers have been re-distributed to provide three outputs per chassis. We will use receivers to complete all chassis including 2 for the ring. This will leave six spare receivers to be returned to Jim Pogge.

### CLO Lab

1. The estimates are in.
2. Estimates for furniture: Quote received from the same company that built benches for the Controls Lab. No budget has been defined and the lab space renovation has not been approved.
3. Training required for Lab Space Managers, I have training with Sam McKenzie and Frank Kornegay to go over the Research Safety Summary. Detailed lab plans for all four of our lab areas have to be developed, Mez, HEBT laser room, C-141, and C-143. No Action taken.

## Electronics and Timing

1. All parts for the ETS board are in except the PCB and Lemo connectors, The PCB is on Order and we will transfer the parts to IES Gray next week.
2. A prototype has been delivered to Software along with a copy of the revised register specification, testing will begin soon. All cables are in. The new modified adapter to correct BNL mistake is being quoted.
3. Calibration. All test devices have been identified, and they will be sent to calibration, on Feb 14<sup>th</sup>
4. FBLM, The FBLM amp is complete and prototype tested, The HV controller will be in next week. The front panel is out for quote. Parts lists will be generated next week.
5. The emittance scanner transmitter is designed and will be laid out next week
6. Emittance scanner receiver is in design and will be ready for review next week.
7. RF distribution system has had an evaluation, and new parts list will be ordered to include the ring pending approval.
8. Optical amplifiers are under evaluation, for ordering.
9. New Boxes are waiting for Power budget test and approval of purchases.
10. Continued installation will require additional Fiber splicing materials.
11. Jim will be at Los Alamos next Friday to help assemble the harp electronics and control system.

### Computing support, Data Management

#### This Week

- Completed Order for PCs - 30 4u and 15 2u. These are on hold until additional funds can be approved for FY05.
- Updated Database with Info learned from BNL and new Ring service building layout.

#### Next couple of weeks

- Continue with SP2 and image.
- Account for needed PCI cards.
- Get BNL Bootable CDs specifically designed for their BPM tests.
- Get the Motherboard monitoring done. Look at MOM 2005
- Ring Cables Specifically BIG, VFM, Harp, IPM, EC.
- Watchdog, Anti-virus software, remote control software.
- Windows on the ICS Security plan.

### General

The diagnostics plan for supporting the next two commissioning milestones (SCL readiness by July, Ring readiness in November) was reviewed. We are still short some resources. A proposal was developed that identifies the required resources and the activities that could be most efficiently supported. This was presented at eh Friday installation meeting and will be discussed in a separate meeting next week.

A VC was arranged for to discuss BNL Diagnostics cost/schedule and the revised production plan.

Cryomodule production:

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